DEWS	**DRY EYE: DIAGNOSTIC TEST TEMPLATE**	
RAPPORTEUR	Kazuo Tsubota, E Goto	27th Dec 2006
Reviewers	A J Bron	
TEST	**Tear Evaporation Test**	
TO DIAGNOSE	The evaporative contribution to dry eye. eg. Evaporative Dry eye	REFERENCES
VERSION	[1]	
DESCRIPTION	This test quantitatively measures tear evaporation from the ocular surface.	
CONDUCT of TEST	1. Set-up tear evaporation meter. 2. The evaporation device is placed around the eyes of the patient and sits in place for 90 secs to 3 mins. 3. Depending on the device, the examination will be performed on one eye or both eyes. 4. The patient's tear evaporation rate will be calculated by the device.	Tsubota & Yamada, 1992 Shimazaki et al, 1995 Goto et al, 2003
Web Video	Not available	
Materials:	The Goto' system consists of: 1. An eye-cup in the form of a ventilated chamber;, 2. An air supply at a constant flow rate, provided by an air compressor. The humidity of the air is known. 3. A quartz crystal sensor, which has high sensitivity to humidity. The frequency of the sensor shifts in response to changes in humidity. Evaporation rates are measured by calculating the difference between the water content of the air entering and exiting the cup. Other related systems have been reported by: Hamano et al, 1980, Rolando & Refojo, 1983; Tsubota & Yamada, 1992 (TEROS); Mathers et al, 1993.	Goto et al, 2003
Standardization	Time of day [n/a] Temperature [below 25°C] Humidity [40%] Air speed [n/a] Illumination [n/a]	Tsubota & Yamada, 1992
Variations of technique	There are many variations of this test. Please see references.	Hamano et al, 1980 Rolando & Refojo, 1983 Rolando et al, 1983 Mathers et al, 1993 Mathers, 1993 Mathers & Lane, 1998 Shimazaki et al, 1998
Diagnostic value	This version : [1] Other version: [ ] This technique is valuable for research purposes but not for clinical use because this device is not readily available.	
Repeatability	Intra-observer agreement. [acceptable] Inter-observer agreement. [acceptable]	
Sensitivity	**[NA]**	
Specificity	**[NA]**	
Other Stats	I	
Test problems	Occasional technical problems	
GLOSSARY		

References

Goto E, Endo K, Suzuki A, Fujikura Y, Matsumoto Y, Tsubota K. Tear evaporation dynamics in normal subjects and subjects with obstructive meibomian gland dysfunction. *Invest Ophthalmol Vis Sci* 2003;44(2):533-9.

Hamano H, Hori M, Mitsunaga S. Application of an evaporimeter to the field of ophthalmology (in Japanese). *J Jpn Contact Lens Soc* 1980;22:101-7.

Mathers WD, Binarao G, Petroll M. Ocular water evaporation and the dry eye. A new measuring device. *Cornea* 1993;12(4):335-40.

Mathers WD. Ocular evaporation in meibomian gland dysfunction and dry eye. *Ophthalmology* 1993;100(3):347-51.

Mathers WD, Lane JA. Meibomian gland lipids, evaporation, and tear film stability. *Adv Exp Med Biol* 1998;438:349-60.

Rolando M, Refojo MF. Tear evaporimeter for measuring water evaporation rate from the tear film under controlled conditions in humans. *Exp Eye Res* 1983;36(1):25-33.

Rolando M, Refojo MF, Kenyon KR. Increased tear evaporation in eyes with keratoconjunctivitis sicca. *Arch Ophthalmol* 1983;101(4):557-8.

Shimazaki J, Sakata M, Tsubota K. Ocular surface changes and discomfort in patients with meibomian gland dysfunction. *Arch Ophthalmol* 1995;113(10):1266-70.

Shimazaki J, Goto E, Ono M, Shimmura S, Tsubota K. Meibomian gland dysfunction in patients with Sjogren syndrome. *Ophthalmology* 1998;105(8):1485-8.

Tsubota K, Yamada M. Tear evaporation from the ocular surface. *Invest Ophthalmol Vis Sci* 1992;33(10):2942-50.